



Chapter 11: Communications



Overview

Introduction

Communication between mariners has long been recognized as a necessity. Using the radio proficiently and knowing proper radio protocol reflects well upon the boat crew's and the radio operator's professionalism. It is essential that each boat crew member is completely aware of the common distress signals and how they are used in emergencies. This chapter will provide you with the basic knowledge of voice communication conventions, procedures, and the various distress signals.

NOTE &

For additional information on Coast Guard communications, refer to the *Telecommunication Manual*, COMDTINST M2000.3 (series) and *Radiotelephone Handbook*, COMDTINST 2300.7 (series).

NOTE &

All operators should check all of their radio equipment for proper operation before getting underway and immediately report any malfunctions. Most marine communications are done by using voice radio transmissions. These are very much like two people talking on the telephone, but with significant differences that boat crew members must understand.

Typically, voice radio communications are "simplex," or one way at a time - when one person is speaking, the second person must wait. This differs from face-to-face and telephone conversations where voices may overlap. Simplex communication is the reason for many of the procedural regulations for voice radio communications.



In this chapter

These items are discussed in this chapter:

Section	Topic	See Page
A	Radio Signal Characteristics	11-3
В	Prowords and Common Abbreviations	11-11
С	Verbal Communications	11-13
D	Radio Operating Procedures	11-17
Е	Communicating Between Coast Guard Facilities	11-19
F	Emergency Voice Communications and Distress	11-23
	Signals	
G	Radio Checks	11-33



Section A. Radio Signal Characteristics

Overview

Introduction

Type of modulation and frequencies are the two basic characteristics shared by radio signals. To understand radio communications, it is fundamental for all crew members who use the radio to know about types of modulations, use of the different radios, and frequencies.

In this section

These items are discussed in this section:

Topic	See Page
Modulation and Frequency	11-4
Radio Systems	11-5
Radio Frequencies	11-7



Modulation and Frequency

A.1. Types of modulation

Modulation is a variation in radio wave amplitude or frequency. The Coast Guard uses the common types of modulation:

- Amplitude Modulation (AM) Single Side Band (SSB) MF/HF, some VHF systems and UHF
- Frequency Modulation (FM) very high frequency (VHF) systems

A.2. Frequencies, types, and ranges

The Coast Guard uses several types of frequencies, each generally capable of AM (SSB) and FM modulation. For maritime use, the most commonly used radio frequencies are in the following ranges:

Band	Frequency Range
Medium Frequency (MF)	0.3 to 3 MHz
High Frequency (HF)	3 to 30 MHz
Very High Frequency (VHF)	30 to 300 MHz
Ultra High Frequency (UHF)	300 to 3000 MHz



Radio Systems

A.3. General

There are several basic types of voice radios, on boats they are frequently MF/HF and VHF-FM, usually, they are identified by the radio's mode of transmission. Understanding the basic differences of the types of radios and their use will assist crew members in using them most effectively and professionally.

A.4. Radio systems use and performance

Every Coast Guard boat carries a VHF-FM radio; many will also carry an MF-HF radio. There are several differences in usage and performance of MF-SSB and VHF-FM radios.

A.4.a. VHF line of sight radio

VHF-FM (156-162 MHz) is used for local, short range marine communications. Frequencies in this band operate on the line-of-sight principle (LOS), its range depends mainly on the height of antennas for both the receiving and transmitting stations, and somewhat on the power output of the transmitting station. VHF equipment is called "line-of-sight radio" because its radio waves travel in nearly a straight line, meaning, if one antenna can "see" another antenna, communications between the two is possible. Occasionally, atmospheric conditions allow VHF signals to bounce or bend in their line of travel, increasing the transmission's range farther than normal.

A.4.b. VHF-FM National Distress System The Coast Guard VHF-FM National Distress System (NDS) provides distress, safety, and command and control communications coverage in most areas of boating activity (including inland waters) in which the Coast Guard has SAR responsibilities. It is designed to provide coverage for, or "see," a radio with an antenna 6 feet above the water and up to 20 miles offshore for most areas in U.S. coastal waters (see Figure 11-1).

Line-of-Sight Figure 11-1



A.4.c. MF and HF bands

Boats use the MF band typically to communicate with the Group when out of VHF radio range. The MF band uses low frequencies, so the ground wave travels along the surface of the earth, permitting communications at distances up to 100 miles during daylight hours. The low frequency also makes communications at much greater distances at night easier. MF and HF radios of any modulation type usually have greater range than VHF. The operating range for MF and HF radios can shift as conditions change, and the conditions that affect the operating range will typically vary from hour to hour. As a consequence, communications between two vessels can be lost due to a number of factors, including changing weather.

A.4.d. VHF-FM and MF/HF comparison

This table summarizes the major advantages and disadvantages of the radio systems discussed above:

Radio System	Advantages	Disadvantages
VHF-FM	• Relatively static free signal transmission	Limited range
		 Overcrowding
	Offers a wide range of frequencies	causing interruptions
MF and HF	Greater range	Interference (caused by atmospheric
	 Less traffic and less interruptions than VHF-FM 	conditions)



Radio Frequencies

A.5. General The following are the most common frequencies for VHF-FM and

MF/HF bands and the purpose assigned to each.

A.6. VHF-FM This is a list of the most common VHF-FM channels used for marine operations. It is organized by channel and frequency in megahertz (MHz),

followed by their use.

Channel	Frequency (MHz)	Use
6	156.300	Intership safety and SAR communications for ships and aircraft.
9	156.450	Alternate calling channel for non-commercial vessels (Some Coast Guard districts have high level radio sites with Channel 9 capability)
12	156.600	Used for port operations.
13	156.650	Bridge-to-Bridge VHF-FM frequency. Transmissions on this frequency are limited to one watt output, with few exceptions. This frequency is to clarify a vessel's intent in meeting and passing situations, as described in the Navigation Rules (COLREGS). Do not use for communications between Coast Guard boats and stations.
16	156.800	 International calling and distress frequency use by vessels in emergencies or to establish contact with others. Shore stations use it to announce broadcasts of general information on other frequencies, boat crew use Channel 16 to: Transmit/receive distress calls and distress messages. Transmit/receive urgent safety broadcasts and messages. Identify vessel traffic concerns. Place a preliminary call to other units in order to establish communications and shift to a working frequency to after contact Do not use this channel to deliver general information messages
21A	157.05	Intra-Coast Guard VHF-FM working frequency for units in maritime mobile operations.



Channel	Frequency (MHz)	Use
22A	157.100	Primary VHF-FM liaison frequency for communications between Coast Guard units and civilian stations. It is also used for making Coast Guard Marine Information and Marine Assistance Request Broadcasts (MARBs).
		The Coast Guard may permit nongovernment use to conduct short business transactions on 22A on a not-to-interfere basis with Coast Guard communications.
23A	157.15	Intra-Coast Guard VHF-FM working frequency used for communications between Coast Guard units working in maritime mobile operations.
81A	157.075	Intra-Coast Guard VHF-FM working frequency for units in maritime mobile operations.
83A	157.175	Intra-Coast Guard VHF-FM working frequency for units in maritime mobile operations.

NOTE &

All vessels equipped with a VHF-FM radio are required to monitor Channel 16. Use this channel only when unsuccessful in establishing contact with units on a working frequency.

NOTE &

Usually radio communications checks are done on working frequencies.

A.7. MF/HF-(SSB)

Outlined below is a list of common MF/HF frequencies used for marine operations followed by their use.

Frequency (kHz)	Use	
2003	Intership safety frequency for the Great Lakes only	
2082.5	Intership safety frequency for all areas	
2142	Intership safety frequency for the Pacific coast area south of latitude 42° North (daytime only).	



Frequency (kHz)	Use	
2182	International distress and calling frequency used world-wide for distress	
	calls and for urgent message traffic. Also, ship and shore stations may use	
	it to establish initial contact, then shift to a proper working frequency for	
	passing operational traffic. All units must maintain radio silence on this	
	frequency for three minutes, twice each hour; radio silence should begin	
	on the hour and half hour, except for transmitting distress, or urgency	
	messages, or vital navigation warnings.	
2203	Intership safety frequency for the Gulf of Mexico only	
2638	International intership safety frequency	
2670	Coast Guard working frequency used to broadcast urgent safety	
	messages; precede messages on 2670 kHz with a preliminary	
	announcement on 2182 kHz. Primary MF/HF Coast Guard/civilian	
	liaison frequency.	
2738	International intership safety frequency. Coast Guard and Auxiliary boats	
	may use this frequency to communicate with other vessels in all areas,	
	except the Great Lakes and Gulf of Mexico.	
2830	Intership safety frequency for the Gulf of Mexico only.	
3023 and 5680	International SAR on-scene frequencies. Use either of these frequencies	
	to conduct communications at the scene of an emergency or as the SAR	
	control frequency.	
4125	International distress and safety; used in Alaska	
5680 and 3023	International SAR on-scene frequencies. Use either of these frequencies	
	to conduct communications at the scene of an emergency or as the SAR	
	control frequency.	
5692	Aircraft working frequency	
5696	Coast Guard Aircraft primary frequency (air to ground)	





Section B. Prowords and Common Abbreviations

B.1. General

Prowords speed the handling of radio messages by abbreviating single word or phrases to replace common words, phrases, sentences, and even paragraphs. Among other things, knowing and using Prowords help to reduce radio traffic by performing radio transmissions efficiently. The following table contains the most common Prowords used.

Proword	Meaning	
AFFIRMATIVE	Yes.	
ALL AFTER	The portion of the message to which I make	
	reference is all which follows.	
ALL BEFORE	The portion of the message to which I make	
	reference is all which comes before.	
BREAK	I hereby indicate the separation of text from other	
	portions of the message.	
CORRECT	You are correct, or what you have transmitted is	
	correct.	
CORRECTION	An error has been made in this transmission.	
	Transmission will continue with the last word	
	correctly sent. The correct version is	
ETA	Estimated time of arrival.	
ETD	Estimated time of departure.	
ETR	Estimated time of return or repair.	
FIGURES	Indicates numbers or numerals to follow. Used	
	when numbers occur in the text of a message.	
FROM	The originator of this message.	
I SPELL	I shall spell the next word phonetically.	
OPS NORMAL	Used to say the patrol is normal in all respects,	
	"operations normal".	
OUT	Used following the last line of the message	
	transmitted, signifying the end of the transmission	
	and nothing follows. No reply is required or	
	expected.	



Proword	Meaning	
OVER	Used following a transmission when a response	
	from the other station is necessary. It is an	
	invitation to the other station to transmit.	
NEGATIVE	No.	
ROGER	I have received your transmission satisfactorily.	
I SAY AGAIN, or	I am repeating transmission or the portion	
REQUEST YOU	indicated, or you should repeat your transmission	
SAY AGAIN	or the portion indicated.	
SILENCE (Spoken	Cease all transmissions immediately. Silence will	
3 times and	be maintained until lifted. Used to clear routine	
pronounced SEE	transmissions from a channel only when an	
LONS)	emergency is in progress.	
SILENCE FINI	Silence is lifted. Indicates the end of an emergency	
(Pronounced SEE	and resumption of normal traffic.	
LONS FEE NEE)		
THIS IS	This transmission is from the station whose	
	designator immediately follows.	
TO	The addressees immediately following are	
	addressed for action.	
UNKNOWN	The identity of the station which you are trying to	
STATION	establish communications with is unknown.	
WAIT	I must pause for a few seconds.	
WAIT OUT	I must pause longer than a few seconds.	
WILCO	Will comply with your last order or request.	
WORD AFTER		
	follows.	
WORD	The word to which make reference is that which	
BEFORE	precedes.	
WRONG	Your last transmission was not correct. The	
	correct version is	



Section C. Verbal Communications

Overview

Introduction

Letters and numbers spoken over a radio are often difficult for others to understand. Spelling out words and numbers that may be easily confused over a radio help clarify their meaning. Knowing how to pronounce the Phonetic Alphabet and numbers over the radio increases the chance that all voice communications between your boat and others are successful.

In this section

These items are discussed in this section:

Topic	See Page
The Phonetic Alphabet	11-14
Numbers and Decimal Points	11-16



The Phonetic Alphabet

C.1. Speaking the phonetic alphabet

The Phonetic Alphabet is based on the assumption that it is easier to understand a word than a letter. The Phonetic Alphabet is a series of words, each standing for a letter in the alphabet. Boat crew members should memorize each word of the Phonetic Alphabet listed below and always be ready to pair them to the correct letter in the alphabet.

Alphabet	Phonetic Alphabet	Pronounced
A	ALPHA	AL-FA
В	BRAVO	BRAH-VOH
С	CHARLIE	CHAR-LEE
D	DELTA	DEL-TAH
Е	ЕСНО	ECK-O
F	FOXTROT	FOKS-TROT
G	GOLF	GOLF
Н	HOTEL	HOH-TEL
I	INDIA	IN-DEE-AH
J	JULIETT	JEW-LEE-ETT
K	KILO	KEY-LOH
L	LIMA	LEE-MAH
M	MIKE	MIKE
N	NOVEMBER	NO-VEM-BER
O	OSCAR	OSS-CAR
P	PAPA	PAH-PAH
Q	QUEBEC	KAY-BECK
R	ROMEO	ROW-ME-OH
S	SIERRA	SEE-AIR-RAH
T	TANGO	TANG-GO
U	UNIFORM	YOU-NEE-FORM
V	VICTOR	VIK-TAH
W	WHISKEY	WISS-KEY
X	XRAY	ECKS-RAY
Y	YANKEE	YANG-KEY
Z	ZULU	Z00-L00



C.2. Using the phonetic alphabet

To use the phonetic alphabet to spell out difficult words within a message, always precede the actual spelling with the procedural words (prowords) "I spell."

Example: "Search from Saugatuck, I spell, Saugatuck - SIERRA, ALPHA, UNIFORM, GOLF, ALPHA, TANGO, UNIFORM, CHARLIE, KILO - Saugatuck to King's Point."



Numbers and Decimal Points

C.3. Using numbers and decimal points

Numbers and the term "decimal point" can be misunderstood when spoken over a radio. To reduce confusion, pronounce numbers differently over the radio than when speaking in normal conversation. Table 12-3 contains the radio pronunciation.

Numeral	Spoken As
0	ZE-RO
1	WUN
2	TOO
3	THUH-REE
4	FO-WER
5	FI-YIV
6	SIX
7	SEVEN
8	ATE
9	NIN-ER
Decimal	DAY-SEE-MAL

C.3.a. Prowords preceding numbers

Always precede numbers with the proword "FIGURES," except in the heading of a message.

Example: "The master indicates he has FIGURES WUN, ZERO PERSONS ON BOARD, INCLUDING SELF."

C.3.b. Multiple numbers

When a number consists of more than one numeral or digit, pronounce it one numeral at a time with a short pause between numerals.

Example: 52 - Say, "Figures FI-YIV, TOO;" do not say, "FIFTY-TWO."

C.3.c. Decimals

Include decimals in a spoken number by saying the word decimal ("DAY-SEE-MAL") in the proper location.

Example: 156.8 is pronounced: "Figures WUN, FI-YIV, SIX, DAY-SEE-MAL, ATE," **not** "ONE FIFTY-SIX DECIMAL EIGHT."



Section D. Radio Operating Procedures

D.1. General

As a boat crew member, operating a voice radio will be a frequent task for you, so you should be familiar and comfortable with using a radio. It is important to learn basic procedures and ways for properly using the radio so that messages are sent and received in the most effective and professional manner.

D.2. Basic radio discipline

Learning and understanding the following will help you use voice radios effectively:

Check setting	Be certain the radio is set on the proper frequency.
Squelch control	Squelch control blocks out weak signals. Adjust the squelch control
	until the noise can be heard, then adjust it slightly in the opposite
	direction until the noise stops. Setting the squelch control adjusts the
	receiver so only signals strong enough to pass the level selected will be
	heard and reduces the amount of static noise on the speaker.
Do not interrupt	Before beginning a transmission, listen for a few seconds to avoid
others	interrupting other communications that are already in progress.
Microphone	Keep the microphone about 1 to 2 inches from your lips. When
placement	transmitting, shield the microphone by keeping your head and body
	between noise generating sources (such as engine noise, wind,
	helicopter, etc.) and the microphone.
Know what you will	Before keying the transmitter, know how to say what you are going to
say	say. Keep all transmissions short and to the point. Never "chit-chat" or
	make unnecessary transmissions on any frequency.



Speaking	Speak clearly, concisely, and in a normal tone of voice, maintaining a natural speaking rhythm.
Phonetic Alphabet	Use the Phonetic Alphabet to spell out a word or a group of letters.
Speak slow so others can write	Send transmitting messages only as fast as the receiving operator can write.
Proper Prowords	Use proper prowords, ending each transmission with "over" and the last with "out." Never say "over and out."
Proword for pauses	In cases where a pause for a few seconds between transmissions is necessary, use the proword "wait." If the pause is to be longer than a few seconds, use prowords "wait, out." Do not use "wait one" or "stand by."
Messages are not Private	Remember, your transmission may be heard by anyone with a radio or scanner.

NOTE &

When transmitting, the microphone may pick up the conversations of people talking near you.

D.3. Use of appropriate radio language

The following is a list of things not to do while using the radio. Items on this list are either not protocol, they are illegal, or they cause misunderstandings of messages.

Do not...

- Break Radio Silence! Break it only for emergencies or ensuring safe navigation under the Bridge-to-Bridge Radiotelephone Act.
- Use profane or obscene language.
- Use unauthorized prowords, abbreviations, and procedures.
- Speak using extremes of voice pitch, this will cause distortion.
- Slur syllables or clip your speech, they are hard to understand.
- Use phrases such as "would you believe," "be informed," or "be advised,". They are unprofessional and not correct procedure.
- Key the microphone unless you are ready to transmit. Keying the microphone also transmits a signal, causing interference on that frequency.
- Use "10 Codes" such as those used by many law enforcement agencies.



Section E. Communicating Between Coast Guard Facilities

Overview

Introduction

Communicating with other units within the Coast Guard will be a common task required of you. Knowing proper call signs and reporting procedures will become "second-nature" to you, even so, be careful to always use the military message formats. Radio communications are an official record, they reflect upon the ability of the entire boat crew, and the information you report to other units is important, especially in emergencies.

In this section

These items are discussed in this section:

Topic	See Page
Coast Guard Voice Call Signs and Ops Normal Reports	11-20
Bridge-to-Bridge Communications Required	11-22



Coast Guard Voice Call Signs and Ops Normal Reports

E.1. General

Voice call signs are used to identify the craft that is calling or being called over voice radio. A Coast Guard boat's number or an Auxiliary boat's number serves as voice call sign for radio communications. This table summaries the different Coast Guard facilities and how to state each call sign you may encounter in the field.

Facility	Call Sign
Coast Guard	"COAST GUARD FO-WER WUN THUH-REE ZE-RO
boat	ZE-RO" (41300)
Auxiliary Boat	"COAST GUARD AUXILIARY VESSEL TOO TOO
	SEVEN ATE TOO (22782)"
Cutter	"COAST GUARD CUTTER DILIGENCE"
Shore Radio	"COAST GUARD" followed by the type of facility air,
Facilities	radio, or station, and the geographical location if
	necessary; e.g., COAST GUARD GROUP KEY WEST
Aircraft	"COAST GUARD SIX FI-YIV ZE-RO ATE" (6508)
Aircraft	"RESCUE" shall be included as part of the call sign
involved in	"COAST GUARD RESCUE SIX FI-YIV ZE-RO
SAR	ATE." (6508)

NOTE &

"COAST GUARD" may be dropped once establishing communications with other Coast Guard units on Coast Guard frequencies. Number call signs may be shortened to the last three digits, if it doesn't cause confusion. For example, Coast Guard Boat 41357, already communicating with another Coast Guard unit, could refer to themselves simply as "THUH-REE FI-YIV SEVEN."

E.2. Ops normal reports

When underway, boat crews are required to provide an operations normal (Ops Normal) report every 60 minutes or according to local policy. The information to report is:

- Current position
- Operational status
- Significant changes in weather, wind and sea



Example: "Coast Guard Station Neah Bay, this is Coast Guard Four Seven Three One Five. Operations normal. My position is one mile north of Tatoosh Island. Wind has increased to 25 knots, seas have increased to 6 feet. Over."

If a boat is unable to establish communications with its command, it should use alternate methods, this may include:

- Relaying information through another unit
- Using cellular telephones, if available
- Using the marine operator



Bridge-To-Bridge Communications Required

E.3. General

Coast Guard boats shall follow the requirements of the Bridge-to-Bridge Radiotelephone Act of 1971 ("bridge" meaning the bridge or conning station of a ship). This Act was written mainly for ships but *the Coast Guard Telecommunications Manual* discusses those requirements that apply to boats.

E.4. Bridge-tobridge communications required

Both the Radiotelephone Act and the *Telecommunications Manual* require the following boats to use Bridge-to-Bridge communications:

- Every buoy boat and aids-to-navigation boat, or any other boat 26 feet or greater in length, when operating in or near a channel or fairway and conducting operations likely to restrict or affect navigation.
- Every towing vessel 26 feet or greater in length while navigating.

E.5. Other use Channel 13

All other Coast Guard boats shall use Channel 13 for the exchange or monitoring of navigational information. This information includes only that necessary for mission requirements or necessary to assure safe navigation.

E.6. Limiting transmission power

For bridge-to-bridge communications, limit the transmission power to one watt or less except in the following situations, when use of more power may be considered:

- Any emergency situation
- When the vessel called fails to respond to a second call at low power
- When making a broadcast in the blind (e.g., rounding a bend in a river)



Section F. Emergency Voice Communications and Distress Signals

Overview

Introduction

Whether your are providing emergency assistance or in need of it yourself, your knowledge of the correct procedures and available equipment can save lives.

In this section

These items are discussed in this section:

Topic	See Page
Standard Voice Radio Urgency Calls	11-24
Emergency Position Indicating Radiobeacon (EPIRB) and	11-27
Emergency Locator Transmitter (ELT)	
Global Marine Distress and Safety System (GMDSS)	11-29
Distress Signals	11-30



Standard Voice Radio Urgency Calls

F.1. General

When an emergency occurs, use the proper prowords to show the degree of urgency. Hearing one of these urgency calls should trigger specific responses in a listener, such as, preparing to collect information on an emergency or refraining from transmitting on the frequency until all is clear. The meaning of each urgency call is outlined below.

F.2. MAYDAY

MAYDAY is a distress call of the highest priority. Spoken three times, it shows that a person, boat, or aircraft is threatened by grave or imminent danger and requires immediate assistance. Broadcast on 2182 kHz or Channel 16.

F.2.a. Priority

A MAYDAY call has absolute priority over all other transmissions and shall not be addressed to a particular station.

F.2.b. Station responses

All units hearing a MAYDAY call should immediately cease transmissions that may interfere with the distress traffic, and continue to listen on the distress message's frequency.

NOTE &

If the unit transmitting the distress call is determined to be some distance from you, pause a few moments to allow ships or stations nearer the scene to answer.

NOTE &

When working a distress situation on Channel 16, do not attempt to change (shift) to a working channel until enough information is obtained to handle the distress in case communications are lost during the act of shifting.

F.3. PAN-PAN

Broadcast on 2182 kHz or Channel 16, this urgency signal consists of three repetitions of the group of words "PAN-PAN" (*PAHN-PAHN*). It means that the calling station has a very urgent message to transmit concerning the safety of a ship, aircraft, vehicle, or person.



F.4. SECURITÉ

"SECURITÉ" (*SEE-CURE-IT-TAY*) is a safety signal spoken three times and transmitted on 2182 kHz on Channel 16. It indicates a message on the safety of navigation, or important weather warnings will be transmitted on 2670 kHz or Channel 22.

F.5. Radio alarm signal

The radio alarm signal consists of two audible tones of different pitch sent alternately, producing a warbling sound. If used, the alarm continuously sends the signal for not less than 30 seconds or more than one minute, and the recipient of the signal should follow the signal by the radio distress signal and message. There are two primary reasons to use a radio alarm signal:

- To attract the attention of listeners on the frequency
- To actuate the automatic listening devices found on large ships and occasionally at shore stations

F.6. Receipt of distress messages

When a distressed unit is in your vicinity, acknowledge receipt for the message immediately. However, if the unit is determined to be some distance from you, pause a few moments to allow ships or stations nearer the scene to answer. In the areas where communications with one or more shore stations are practicable, ships should wait a short period of time to allow them to acknowledge receipt.

F.6.a. Receipt procedure

The receipt of distress messages should be in the following manner.

- The distress signal MAYDAY
- The call sign of the unit in distress (spoken three (3) times)
- The words THIS IS (spoken once)
- The call sign of your unit (spoken three (3) times)
- The words RECEIVED MAYDAY
 - Use SAR Incident check-off sheet
 - Request essential information needed to effect assistance, (position, number of people on board, nature of distress, vessel's description) obtain less important information in a later transmission.
- The proword OVER.



F.6.b. Inform distressed unit of CG assistance

Inform THE DISTRESSED UNIT of any Coast Guard assistance being dispatched and to stand by.

F.6.c. Vessel and shore stations

Vessels and shore stations receiving distress traffic should by the most rapid means:

- Forward the information to the Operations Center (OPCEN).
- Set a continuous radio watch on frequencies of the distress unit.
- Maintain communications with the distressed unit.
- Maintain distress radio log.
- Keep the OPCEN informed of new developments in the case.
- Place additional people on watch if necessary.
- Obtain radio direction finder bearing of distressed unit if equipment and conditions permit.

F.6.d. Transmit information

Every Coast Guard ship or aircraft which acknowledges receipt of distress messages, ensuring it will not interfere with stations in a better position to render immediate assistance, shall on the order of the Commanding officer or Officer-in-charge, transmit as soon as possible the following information to the unit in distress:

- Acknowledgment of unit's name and position
- Speed of advance of assisting unit to scene
- Estimated time of arrival at scene

F.6.e. Keeping distressed unit informed

CAUTION!

Needless shifting of frequencies by you or the distressed unit may end in a loss of communications. Keep the distressed unit informed of any circumstances that may effect your assistance to him such as speed, sea conditions, etc. Speak in a tone of voice that expresses confidence. After receiving a distress call or information pertaining to one, Coast Guard units shall, within equipment capabilities, set a continuous radio guard on the frequency of the distressed unit and set up a radio schedule if the distressed unit is unable to stand a continuous watch.



Emergency Position Indicating Radiobeacon (EPIRB) and Emergency Locator Transmitter (ELT)

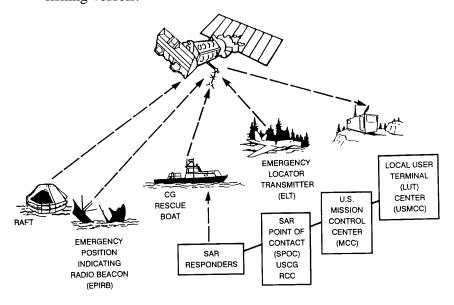
F.6. General

NOTE &

Additional information on EPIRBs, ELTs, and the COSPAS-SARSAT system, are found in *Chapter 3* of the *National Search and Rescue Manual, Volume I.*

The emergency position-indicating radio beacon (EPIRB) is carried on vessels to give a distress alert. Aircraft have a similar device called an emergency locator transmitter (ELT). The original EPIRB and ELT transmitted on 121.5 MHz frequency. However, the 406.025 MHz EPIRB and ELT were developed for satellites to detect these distress alerts. A global satellite detection network, COSPAS-SARSAT, has been established for detecting both 121.5 and 406 MHz distress beacons. (See Figure 11-2). The 121.5 MHz can be detected by facilities that tune onto that frequency, typically aircraft and their support facilities. Coast Guard boats carry the 406 MHz EPIRB. Requirements to carry EPIRBs vary:

- All Coast Guard cutters and most boats have been equipped.
- Optional for Coast Guard Auxiliary vessels.
- Encouraged for recreational vessels.
- Required for U.S. commercial vessels and many commercial fishing vessels.



EPIRB System Operation Figure 11-2



F.7. Types of EPIRBs

There are two main types of EPIRBs.

- 121.5 MHz
- 406 MHz

F.7.a. 121.5 MHz

These beacons transmit anonymously and generate positions accurate to within about 15 nautical miles. 121.5 MHz coverage is limited by the locations of sites selected for ground stations. 121.5 MHz beacons are plagued by a high false alarm rate. 121.5 MHz EPIRBs are categorized as follows:

- Class A 121.5 MHz EPIRBs are designed to float free and may be activated automatically or manually.
- Class B 121.5 MHz EPIRBs must be manually activated.

F.7.b. 406 MHz

The EPIRB transmits a digital signal with a beacon-unique identifier. Owner registration allows automatic distressed vessel identification and provides case prosecution critical information. 406 MHz EPIRBs generate positions accurate to within about 3 nautical miles. 406 MHz EPIRBs have a 121.5 MHz homing signal and strobe. The false alarm rate is much lower for 406 MHz EPIRBs and registration makes it possible to identify false alarms, often before resources launch. 406 MHz EPIRBs are categorized as follows:

- Category I 406 MHz EPIRBs are designed to float free and may be activated automatically or manually.
- Category II 406 MHz EPIRBs must be manually activated.

F.8. EPIRB testing

Different models exist, so test your EPIRB by following manufacturer instructions printed on the beacon. Any test emitting a 121.5 MHz signal must be performed within the first five minutes after the hour and be limited to not more than ten seconds.



Global Marine Distress and Safety System

F.9. General

The Global Marine Distress and Safety System (GMDSS) was developed mainly for larger vessels. However, there will be times that boats have to respond and assist these vessels or to contact them. GMDSS has three key elements which assist SAR:

- Reliable timely distress alerting
- Accurate position indicating, and
- Efficient locating (visual and electronic)

F.10. GMDSS system concept

GMDSS relies on ship-to-shore as well as ship-to-ship distress alerts by satellites and land based radio systems. GMDSS defines four worldwide sea areas and requires ships to have two separate of the following means to send a distress message:

- 406 MHz EPIRB
- Satellite communications (SATCOM)
- HF voice radio
- Error correcting teletype
- Digital selective calling capability

F. 11. Digital Selective Calling (DSC)

Once GMDSS becomes fully operational after 1 February 1999, GMDSS-equipped ships do not have to maintain a live radio watch on Channel 16, VHF-FM. The ship will rely upon digital selective calling (DSC), an automated non-voice feature, to advise the crew of an incoming call. The ship would then communicate on a working frequency. For now, there is no requirement that all VHF-FM radios must have the DSC feature installed. This could create a problem for vessels without DSC to contact GMDSS-equipped vessels. The U.S. is developing additional guidance to address this concern.



Distress Signals

F.12. General

If voice communication is not possible or not effective, you will have to use other means of communication. These may include signals using pyrotechnics, flag hoist signals, hand signals, or a flashing light S-O-S (see Figure 11-3). These signals can be found in the publication called *Navigation Rules*.

F.13. Pyrotechnics

The following are some pyrotechnic emergency signals you may encounter:

- Gun or explosive signal fired at about one minute intervals
- Red or orange flare fired one at a time in short intervals
- Rocket parachute showing a red light
- Smoke
- Any flame on a vessel may be used for signaling

F.14. Flag hoists

Flag hoists are a quick way of emergency signaling, but can only be used in the daytime. These are some of the best known examples:

- A square flag with a ball, or ball-shaped object above or below the flag
- Hoisting an orange flag
- November Charlie Flag

F.15. Hand signals

Possibly the oldest form of signaling are hand signals, but like other methods of visual communications, the signals are not standardized and can be easily misunderstood. Boat crew members must be constantly alert for hand signals from other mariners that are not standard distress signals, but that may be attempts to indicate an emergency situation. These are three standard hand signals that are used as distress signals:

- Slowly raising and lowering an outstretched arm
- Signaling with an oar raised in the vertical position
- Holding a life jacket aloft



F.16. Flashing light/strobe (50-70/min.)

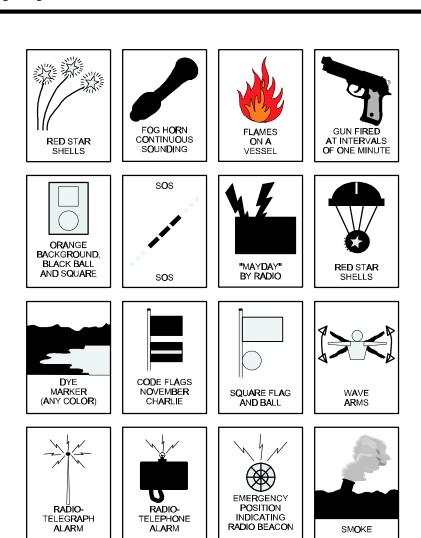
The Morse Code symbols 'SOS' (Save Our Ship) transmitted by a flashing light may be used to communicate distress.

S O S

a strobe light (may be attached to a personal flotation device).

NOTE &

Any unusual signal or action you see could be a signal that a craft is in trouble. You should investigate any peculiar or suspicious signals such as, the U.S. flag flown upside down or continuous sounding of a horn or fog signaling device.



Distress Signals Figure 11-3





Section G. Radio Checks

G.1. General

Radio checks test the signal strength and readability of transmitted radio signals. Checks are a simple way to determine that the radio used to send and receive messages is working properly. This is accomplished by transmitting a request for a radio check and receiving a response from any other station that provides a standardized description of the strength and readability of a transmitted signal. If you are ever in doubt about the readability of the signal you are sending out, you should initiate a radio check to confirm the strength and readability of your signal.

G.2. Reporting procedures

Any station transmitting voice traffic assumes that its signal is clearly readable unless another station responds and reports that the signal strength and readability is less than loud and clear. If you respond to requests for a radio check, always be concise and use a combination of the following standard terms.

Signal Strength	Meaning
Loud	Your signal is strong.
Good	Your signal is readable.
Weak	Your signal is poor but readable.
Very Weak	Your signal is unreadable.

Signal Readability	Meaning
Clear	Excellent quality.
Readable	Satisfactory.
Distorted	Having difficulty in reading the transmission
	because of signal distortion.
Unreadable	The quality of your transmission is so bad I can
	not understand you.
With Interference	Having great difficulty in reading the
	transmission because of interference.

